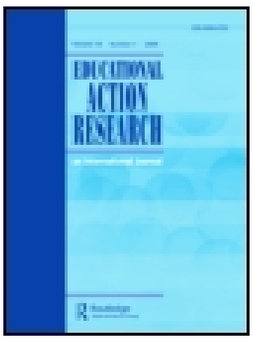

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Enquiry-based learning workshop for deep learning in Middle Eastern classrooms – an action research approach

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ABSTRACT

The senior year design students and I were dismayed when my linear teaching and their habitual rote learning failed in a Middle Eastern University. The gulf between the curricular objectives and our teaching-learning methods intrigued me. I turned this into an action research project that sought to answer the questions, *'What paradigm shift might we need to migrate from traditional rote learning to deep learning? What attitudinal change and philosophical beliefs would that call for in an instructor?'* The search for a solution metamorphosed me from a disengaged instructor into an empathizing reflecting practitioner. It led my students to active engagement in an enquiry-based learning workshop, which significantly improved their performance. This paper celebrates the journey of our collective deep learning. It explicates how I built my personal theory of teaching praxis through critical consciousness and meta reflection. This knowledge-creation process is empowering and may draw many teacher researchers towards meta-reflexive engagement with the social systems around. These change drivers can initiate institutional overhaul to effect systemic reforms.

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Deep learning; learning through enquiry; action research; test anxiety; Saudi Arabia; rote learning

Introduction

What happened when I discussed the first test results in the Professional Practice course and my dialog with students thereafter in the corridors presaged the focus of this research. After a series of initial lectures to my 24 undergraduate Interior Design students of Prince Sultan University in Riyadh, I held the first formative assessment. Our performance dismayed us … As I walked out of the class, a few students accosted me and said in a fragile voice, *'Doctor! Your questions are situational. I memorized everything. I always learned like this. But it is not there in the quiz. We can't answer them. Your test is hard. My CGPA 'd fall. My scholarship 'd cut.'* Before I could respond, another girl named Alanoud[1] said, *'Why do you take attendance? We can't attend all the classes. Doctor! We are Seniors. We've Major Project. No time. Give us your slides. Ask directly from there. All the Doctors do that.'* It is then I realized that my linear methods of 'lecturing-testing' were ineffective to develop the requisite analytical and problem-solving skills in this practice oriented discipline. Specifically, I was absorbed in developing an understanding of: *What paradigm shift teachers might have to bring, to break the inertia of traditional*

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rote learning among the Arab women and inculcate deep learning? What attitudinal change would it call for in an instructor? What multi-dimensional praxis might it take to align students' learning curve with institutional objectives? Which philosophical beliefs of the teacher might alleviate test anxiety?

Rote memorization existed since 5000 BC: Confucian and Vedic periods. Vedas, the oldest Indian classical texts were preserved with immaculate fidelity by continuous oral transmission since the Late Bronze Age. Therefore, it is neither a harmful practice nor does it distract from the development of critical thinking skills (Biggs 2003). However, it eschews comprehension, and is an ineffective tool in mastering any complex subject at an advanced level. Nonetheless, it benefits learners in gaining foundational knowledge, but helps them little in problem-solving. In addition, surface learning and test anxiety have positive significant correlation (Spada et al. 2006).

In contrast to passive rote learning, active approach involves learning by: thinking, reflecting, exploring, questioning and engaging. It leads to deep learning.

A disengaged instructor may suffice rote learning, while promoting deep learning demands dynamic teacher engagement. It involves innovative pedagogy, critical reflection and an empathizing mind. Without these, teachers run the risk of getting trapped: in what Larrivee (2000) calls as unexamined judgments, interpretations, assumptions and expectations. Also, surface level teaching produces surface level student responses (Smith and Colby 2007). This is clearly the case in Saudi Arabia.

Often times surface learning continues into the Arab universities, as the professors merely lecture, possibly owing to their own similar learning history. Consequently, it limits the assessment and evaluation to memorization (Dagher and BouJaoude 2011). However, it doesn't fully align with the objectives of my course 'Professional Practice.' Interior design practice needs ideation, thinking, experiencing, analysis and synthesis. To accommodate higher order learning, teaching styles need to be aligned with emerging metaphors of teacher as social mediator, learning facilitator, and reflective practitioner (Larrivee 2000). Further, there is little empirical research on methods to increase design students' response capacity and to alleviate exam stress in Saudi Arabian classrooms (Smith and Abouammoh 2013).

Therefore, I turned the above questions into an action research project with an enquiry-based learning workshop. I followed the workshop with formative and summative assessments (FA and SA) and feedback. These efforts provided me with an opportunity to observe the actively engaged cohort in; uninhibited enquiry, analytical questioning, debating, role-play, textual reading, peer tutoring and collaboration, both within and beyond the class. This project facilitated me to critically reflect in action. The guided enquiries of students were recorded as a question bank (QB), which I analyzed and evaluated. I also received feed-forward from the students and peers.

This paper explicates how I built my personal theory of teaching praxis through critical consciousness and deep reflection. It records my transformation from a disengaged instructor in an environment dominated by rote learning, into an empathizing reflecting practitioner. This paper celebrates the journey of our collective deep learning. In what follows, I describe through quantitative analysis, evidence on enhanced student performance and engagement. Students showed statistically significant improvement in their learning capacity and analytical abilities, post-workshop and assessments. The differently abled learners found the method inclusive as it provided them additional easement. This study offers new

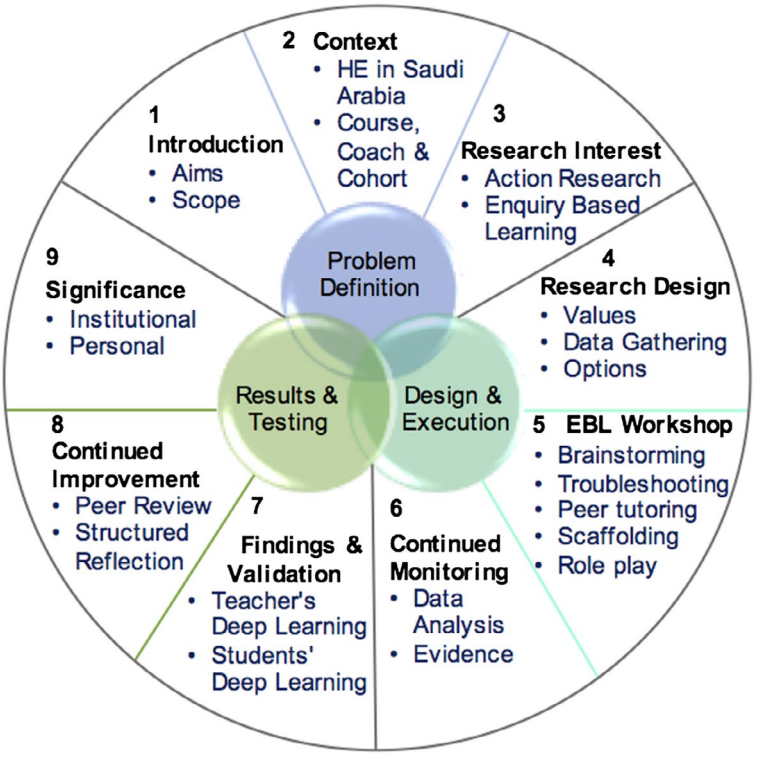

Figure 1. The research framework.

insights into educational practice that fosters deep learning through enquiry-based approach in cohorts accustomed to rote memorization. It also signposts strategies which work and which fail. Figure 1 shows the research framework modeled after McNiff (2016) used in this paper.

The context

Higher education in Saudi Arabia

Study of Islam and religious subjects occupy a significant portion of the curriculum at all levels in Saudi Arabia. Rote learning dominates the pedagogical policy (Smith and Abouammoh 2013). The Sate controls education in a top-down approach that determines the school curricular mandates. Researchers found it to be precluding a broader base of participation by teachers, teacher educators and scientists as well as community members (Dagher and BouJaoude 2011; Smith and Abouammoh 2013, 5).

Along side the outdated curriculum (Dagher and BouJaoude 2011), Saudi Arabia's didactic nature of pedagogy is also criticized (Smith and Abouammoh 2013, 6). The assessment usually emphasizes data recall (a mere surface level approach) rather than problem-solving. Saudi schools and universities reflect Islamic religious methods of learning, acquisition of factual knowledge and summative norm-based assessment (Smith and Abouammoh 2013). However, higher education in Saudi Arabia is undergoing a paradigm shift from traditional methods to proven international methods of curriculum delivery and assessment.

The course, coach and the cohort

The basis for this research is the three credit Senior level 'Professional Practice' course. The course objectives emphasize on independent problem solving and critical thinking. It can be expanded into six sequential steps (1) focusing attention, (2) pattern recognition, (3) comparing and contrasting, (4) grouping and labeling, (5) categorization and identification of phenomena and (6) decision-making (Cottrell 2005). My course aimed to whet these skills and prepare the students for real world challenges that may be faced during the co-op training, and subsequent design practice.

I am an Indian architect, teacher-researcher exposed to conceptual understanding early on at home. I experienced various learning environments of Japan, USA, UK and the Arabian Gulf.

The cohort had 24 Arab women in their early twenties. Living in Saudi Arabia, they faced socio-cultural barriers in visiting design firms and human resource departments of companies for case studies. They have moderate to limited English language proficiency.

What is my research interest?

I inducted the students into the course and explained the expected learning outcomes vis-à-vis assessment methods. When I announced a test from the first few sections covered, the students said,

It's too long. We are seniors. No time. Tell us exact paras to memorize!

I understood the task intimidated and challenged students' memorization ability than giving them pleasure. Assuring an easy test, I went ahead as scheduled.

The test had analytical and data recall questions. While evaluating their answers, I found a majority handled direct questions well, failed in analysis and synthesis domains, and had partial command in technical English. I discussed the answer scripts in our next meeting. To our collective dismay, most students performed poorly. Looking at their answer sheets, the students said in chorus:

Miss! Your questions are logical. We can't answer them. It's difficult.

We also can't go to offices for case studies.

It dawned on me that my delivery misaligned with the cohort's learning. Having obtained a synoptic overview, I needed course correction. I learned that little or no research is published on teachers' knowledge gained while improving the learning capacities of Arab women. There is also little research on the cultural shift needed in instructors vis-à-vis organizations of the Arab World from this perspective. Therefore, to fully comprehend the situation, I had free-wheeling chats with students and colleagues. It emerged that many teachers adopted a surface level approach for cultural reasons and work pressure (20–24 h/ week), especially in theory courses, leaving students to closely follow the suit. Teacher's Power Point slides and/or small textbook selections formed major resource materials for learning and assessment, replacing standard reference works. This also appears to be the learning culture in many parts of the world.

Not surprisingly, when I tested the analytical skills students panicked, possibly due to passive, disengaged cramming after the lectures or before an exam. (In India, students call it 'one-day batting', referring to Cricket lingo). My academic vision and values came head on with cultural inclination and social barriers, as is shown in Figure 2.

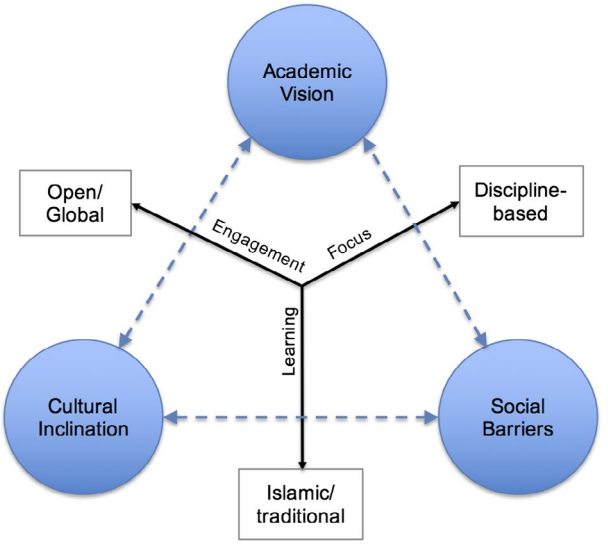

Figure 2. The tension between academic vision, cultural norms and social barriers (revised from Smith and Abouammoh (2013, 183)).

Enquiry-based learning (EBL)

When Test-1 overwhelmed the class, I thought, *'why not the class prepare its own questions and have fun? Would this make learning joyful?'* I took a cue from Larrivee's (2000) suggestion to turn power *over* into power *with* learners to create authentic learning communities. I then considered enquiry-based learning (EBL). It is self-directed enquiry or investigation in which the student is actively engaged in the process of enquiry facilitated by a teacher. From the literature, I realized that EBL increases the quality of teaching and learning, poses different demands on the tutor and calls for extensive preparation (HEA n.d.).

Treading cautiously with these new insights, I planned to improve passive behaviorist rote learning to critically engaged reception learning. I also wanted to simultaneously look inward to effect a change, such that my learning can inform other instructors in the teaching-learning ecosystem.

Action research

Activity and change are pivotal to action research (AR). It progresses in cyclic fashion through five actions: Identify the problem, plan for intervention, effect the change, monitor the progress and reflect on various dimensions of the problem (Figure 3). While AR may provide a basis for theorizing and knowledge production, its 'primary purpose is as a practical tool for solving problems experienced by people in their professional, community, or personal lives' (Stringer 2007, 12). Further, Stringer sees AR as a democratic, equitable, liberating and life enhancing process of inquiry.

Winter (1998) mentions AR as a tool for decentralizing the production of knowledge. It is about finding a voice to speak to, and share the experiences to help others learn. Participatory learning through action-reflection cycle is central to action research. Contrary to other forms of inquiry, action research involves improving the researcher, the research

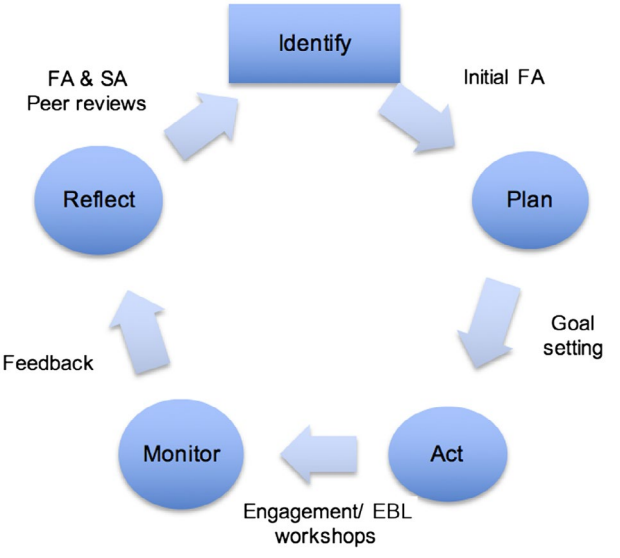

Figure 3. Action research cycle (FA: Formative assessment, EBL: Enquiry-based learning; SA: Summative assessment).

situation and the participants (Arhar and Buck 2000). Many teaching development projects are action research in nature, rather than attempts to be representative and reproducible with a tight research design (Biggs 2003). Therefore, I adopted this approach.

How did I address the questions and gather data?

I believe that my success/failure hinges on the cohort's success/ failure. This fundamental belief is grounded in the following *Vedantic* phrase (in Sanskrit):

Tat Tvam Asi

(Chandogya Upanishad 6.8.7)

(Tr: *That thou art* (literal), or *You are that*, which can be interpreted as the absolute equality of 'tat' (the larger universe) and the 'tvam', (the individual self) (Raphael 1992, 94)).

The questions in front of me were sort of existential: What is my purpose as a teacher? A co-learner? A motivator? A task master? Or a radio-lesson broadcaster? How do I articulate my vison of the 'relational self'?

Taking guidance from Gergen and Gergen (2007, 163), I developed constructivist dialogs that shifted the attention from the individual actor (myself) to coordinated relationships (with the cohort and within the cohort). I used the tool, 'relational know-how – engaging people collectively and fully', which is essential to develop deep working and personal relationships across peoples (Bradbury et al. 2007; 89). It required seeing the world through the perspective of the students, empathizing with them and keeping the channels for dialog open without preconceived notions. Therefore, having a conflict-free environment was important, as academic stress can be self-perpetuating. To eliminate the learning strain, foster lively classroom chemistry and uninhibited enquiry, I adopted an attitude of 'contented expectancy' (Dillon 1988). Therefore, my teaching praxis hinged on the *Upanishadic* tenet (in Sanskrit),

ōm saha nāvavatu saha nau bhunaktu| saha vīryam karavāvahai|

tējasvināvadhītamastu mā vidvisāvahai| ōm śānti śānti śānti hi ||.

(Taittiriya Upanishad 2.1.1)

(Tr: 'May it (the knowledge) protect us both (teacher and pupil)! May it enjoy us both! May we acquire strength together! May our knowledge become bright! May we never quarrel! Peace! Peace! Peace!' (Muller 1961, 54)).

Thus to engage in shared inquiry, I developed the contours of *relational theory* (Gergen and Gergen 2007), through openness, transparent grading policy, continuous scaffolding, formative feedback and student feed-forward. Consequently, the classroom learning was modeled after Tagore (1920, 27), where seekers fearlessly pursued knowledge in *ever-widening thought and action*.

During this process, I also wanted to appreciate the mutually reciprocal, transformational relationship between me and my learners through four important sources of data: my learning, my actions, other's learning and other's actions (McNiff 2016, 143). I monitored my practice through nine simple steps. They involved (1) an EBL workshop where the students actively engaged in the process of guided enquiry and discovery learning in the class, (2) QB thus generated, (3) Formal formative feedback on the QB provided through the virtual learning environment (VLE), (4) Three FAs (tests), one held before the workshop and two later, one of them making use of the QB, (5) teacher's peer review, (6) My own reflection-in-action, (7) SA, (8) student-teacher interactions within and outside of the class and (9) Students' feed-forward in the form of semester end assessment (Appendix 1).

What were my options for intervention?

I chose EBL workshop for three reasons: it gave ample scope (a) for students to enthusiastically engage in collective enquiry under my guidance (Figure 4), (b) for me to closely observe them engaged/disengaged, so that I can acknowledge the sources of learning strain and can eliminate them.

I concentrated on EBL to develop critical questioning attitude to facilitate structured understanding. Interior design practice involves independent decision-making in diverse scenarios and calls for collaborative group work which needs action learning or dialog and discussion. In this mode, the learners become active participants rather than remain passive recipients of teaching stimuli. The EBL workshop emphasized on students asking questions, as I modeled their formulation.

I shaped the students' collective enquiry to form a large QB. After evaluation, editing and feedback, I directed the class to use the QB through VLE. I used this method, to enable mutual sharing of each other's learning. This was to instill confidence and infuse a sense of collective pride. To check the efficacy of the workshop intervention, I used the tests as FA to know about our learning during-learning and to fix the gaps.

To know my teaching and learning gaps, I requested the department chair and another senior academic in architecture to review the following: research context, research plan, design for intervention, assessment methods, grading scheme, my initial reflective account and student's performance before and after the intervention in the first and second rounds of FA. I used their feedback subsequently. In addition, I critically reflected in-action to improve my praxis for sustained deep learning. I used a reflection rubric (Ward and McCotter 2004) which coalesced my thought process at various levels of reflection (such as routine, technical,

Figure 4. The workshop environment.

dialogic and transformative) and three dimensions of reflective enquiry (such as focus, enquiry and change). Following the institutional mandates, I used SA and student-teacher evaluation. They helped me to evaluate the overall effectiveness of deep learning achieved during the semester.

The data were collected for one semester. It comprised of (1) Quantitative data and (2) qualitative data. The former constituted an assessment of 24 students' (a) overall performance in tests, (b) performance in data recall and analytical domains and (c) feed-forward, (d) attendance records, (e) QB and (f) the test question papers. The qualitative data included: (1) in-class teacher's observation during the workshop, tests and in other lecture sessions; (2) semi-structured interviews with students and colleagues; (3) my stagewise descriptive written/ oral feedback; (4) peer review of teaching practice and, (5) my dairy entries of reflection-in action.

What happened during the workshop?

I conducted a weeklong interactive situated learning workshop to engage together in a non-hierarchical environment for uninhibited enquiry. Thereby I provided the students physical, environmental and emotional support to academically de-stress. When I first introduced the EBL workshop, the students showed disbelief, stoicism, and enthusiasm in equal measure, as they never experienced it before in theory courses. The moment they realized that the key to their learning and assessment was being handed over to them, the class was jubilant.

Brainstorming

I lectured for 10–15 min initially on fundamental concepts and rules of the game, allowing reception learning. The students formed small groups (2–3 members) while some worked independently. Taking the topics one-by-one, I explained the formulation of various types of questions after illuminating on the content. I then demonstrated how the same information could be elicited differently through multiple choice (MCQ), supply type and direct

questions etc. I attempted to subdivide the content into smaller quanta of material, for easy practical association with professional settings.

Then, I encouraged them to craft their own logical reasoning, case-based, true/false and matching questions, following the path of discovery learning. I continuously supported them in creating numerical or other problems, as needed. The groups brainstormed within for a brief while to generate ideas, which fostered lateral thinking. I saw the requirement of a thesaurus and textbook and allowed their access online. Following Fry, Ketteridge, and Stephanie (2006), I offered little criticism at this stage until the questions are logged. 'Free-wheeling discussion' on the topics followed this, with easiest topics taken first, while I observed. Students took time to open up and I insisted on everybody's participation, regardless of the medium. The class was noisy as the momentum picked up. I encouraged them to record their questions and answers in groups as they read and analyzed specific textbook sections and similar cases from the internet under my supervision. Each participant formulated five questions in each of the five types experimented. During this weeklong workshop, we had glitches and I offered style and language support individually and in groups. The classroom witnessed intense brainstorming and fun-filled engagement with one another and the lessons covered.

Peer tutoring and role-play

Peer tutoring followed next, where one of the group members explained the content, questions coined and the possible answers and vice versa in Arabic and English. I monitored the tutoring, intervening only when I found them confused. Although I did not know Arabic, I encouraged the students to monitor each other to arrive at the intended meanings. As a result, shy students with moderate English expression also participated actively. As I tried to gather some Arabic equivalents my self, I gained their trust as a co-learner. The engagement was fun.

We then used simulation and role-play together, to develop questions on organizational structure etc., where students and I have donned the roles of employees of fictitious companies. I chose this method to help students relate to complex concepts better (to facilitate the 'making of meaning') (Fry, Ketteridge, and Stephanie 2006, 23).

Scaffolding

As the groups presented their sample questions to the whole class, I restructured them if they were incomprehensible, poor in style or syntax. I scaffolded their efforts in preparing intelligent yet unique answer choices for MCQs and matching questions where homogeneity in question and answer arrays was necessary. I often redirected them to the textbook for deep learning as it was easy for them to go astray when left unsupervised. My personal anecdotes on human fallibility eliminated the fear of failure and reinforced their resolve to explore. I recognized the insufficiency of my English instruction to reach the learners with poor language skills. I then made use of *supervised peer tutoring* in Arabic to scaffold these learners.

The working environment

I ensured that each group sat around a table, in a well lit, airy, and thermally comfortable room, with little external noise (Figure 4). I moved around the groups, at times patting the

students when excellent test-worthy questions were read out, encouraging the rest to applaud. Maintaining an eye contact, I enthused them to take ownership and pride in their work, often naming the questions after them which helped them associate the content with their peers. This prompted even the milder students to open up and read out their questions.

Troubleshooting

The cohort is accustomed to linear methods of lecturing and passive behaviorist rote learning. Consequently, some students could not steadily concentrate on EBL. Shifting from the rut was wrought with behavioral issues. I observed texting, chit-chatting, late-coming, coffee/water fountain excuses or any such minor triggers distracted the class. Hence, I appraised them on limiting the smart phone use to language help during the workshop and lectures. I also suggested them to avoid water fountain and restroom visits during the session. This irked some students. Alanoud was vocal among them. She said bitterly,

> *Doctor! You say, don't use the phone, but how I know if my driver calls? How I go home? You must allow my phone.*
>
> *You say, no restroom. I have bladder problem.*

Her resistance bemused me and the rest of the class felt embarrassed. I felt a point of conflict emerging and our paths diverging. Despite my repeated requests, she started secretly texting and disturbing everybody, apart from making noisy moves in and out of the class.

From my diary entries, classroom observations, and chats with peers, I learned that she is intelligent, and was disengaged sitting in the rear benches (in part due to her earlier absences). Disturbing us was her ploy to seek attention. Having realized this, I played into her ego, by giving her all the attention and opportunity to present. I privately impressed up on the cohort that my interest is in their learning and not in curtailing freedom. I shifted her to the front desk and provided her with my laptop, keeping her phone away on my desk. I made sure that she sat in the front row in all the subsequent sessions. This simple hack changed her. She took responsibility for her learning and stopped missing classes, despite familial inconveniences (when both the parents travel overseas, most women students in Saudi Arabia necessarily accompany). By winning her trust, I scored my first brownie point. What ensued later was a total transformation. The diary entry on the final exam evidences this:

> The final exam room is in the Languages building. I forgot to carry my stapler in a hurry. Alanoud was the first to finish. Not only that, she went to the main building on her own accord, got me a stapler and even helped me sort and staple all the answer books till the last minute. This is quite unusual for Arab girls! As I left the exam hall, her mother and sister came to see me. Her sister, a Junior year business student said this:
>
> *Doctor! My sister tells me so much about your teaching. I'm using her questions, notes. We've some topics same same. She even teaches those.*
>
> Her mother looked at me with folded hands.

How did I continue to monitor the action post-workshop?

The workshop produced over 300 questions of various types and levels of complexity. Students worked beyond the class room, expanding the QB to 600. I chose Moodle (VLE) to

receive the QB and to disseminate my feedback to the whole class. I evaluated all the submissions and provided in-depth formative feedback on content, questioning and responses. Whilst I grasped their learning and expression gaps in restructuring the content, it offered an insight into the effectiveness of EBL tool. So as not to overwhelm the students with a gigantic QB, and to effectively channelize their efforts, I ranked questions on merit and complexity. To encourage, I awarded 1–3 bonus marks for turning in innovative, test ready questions, for I favored rewards over penalties.

To discourage rote memorization, and to examine the efficacy of EBL, I announced Test-2 with 80% questions from the QB and 20% new questions. I held it four weeks after the workshop. Some students engaged themselves in EBL and QB methodology on their own accord for the subsequent chapters. As part of continued FA, I held Test-3 after two more weeks with different content. The end exam (SA) was held subsequently with yet another content. I used the same format for all the tests, as frequently changing format stressed students. This was appropriate as I focussed on the learning engagement than testing.

Peer review illuminated the outside perspective, not easily visible through reflection but is necessary for critical improvement. In addition to the peer review, I reflected in action using Ward and McCotter's rubric (2004). It helped me identify and rectify problematic issues.

How did I analyze and interpret the data in order to generate evidence?

Through classroom observation, I found the students being enthused about the new learning experience of EBL workshop. Our interactions evidenced that it also increased their self-reliance, independence and ability to identify, investigate and address questions. Through practice and reflection the students articulated the questions better. They also benefited from a repertoire of questions the whole class prepared (QB). My hosting them on VLE provided the class real-time access along with my feedback. This increased their engagement and responsibility. All the tests had five question types such as: short answer, multiple choice, true or false, fill in the blanks and association matching (Table 1), with direct recall and analytical components. In each test, direct recall and analytical questions constituted 30–48.8% and 51.3–70% respectively.

I analyzed the data on two fronts: (1) testing the validity of the decisions I made, and (2) examining whether EBL workshop enhanced the students' performance and alleviated test anxiety. The criteria for the former are my core values as a teaching practitioner and the peer

Table 1. Composition (percentage) of questions in formative and summative assessments.

Question type	Formative Assessment						Summative Assessment	
	Test 1		Test 2		Test 3		Final	
Nature of question →	Direct recall	Analytical	Direct recall	Analytical	Direct recall	Analytical	Direct recall	Analytical
SAn	31.3	18.8	26.7	6.7	20.0	13.3	12.5	12.5
MCQ	2.5	10.0	3.3	13.3	3.3	13.3	2.5	22.5
ToF	5.0	7.5	3.3	13.3	0.0	16.7	5.0	20.0
FIB	10.0	2.5	6.7	10.0	10.0	6.7	10.0	15.0
AM	0.0	12.5	0.0	16.7	0.0	16.7	0.0	0.0
Total	48.8	51.3	40.0	60.0	33.3	66.7	30.0	70.0

Notes: SAn: Short answer questions; MCQ: Multiple choice questions; ToF: True or false questions; FIB: Fill in the blanks; AM: Association matching.

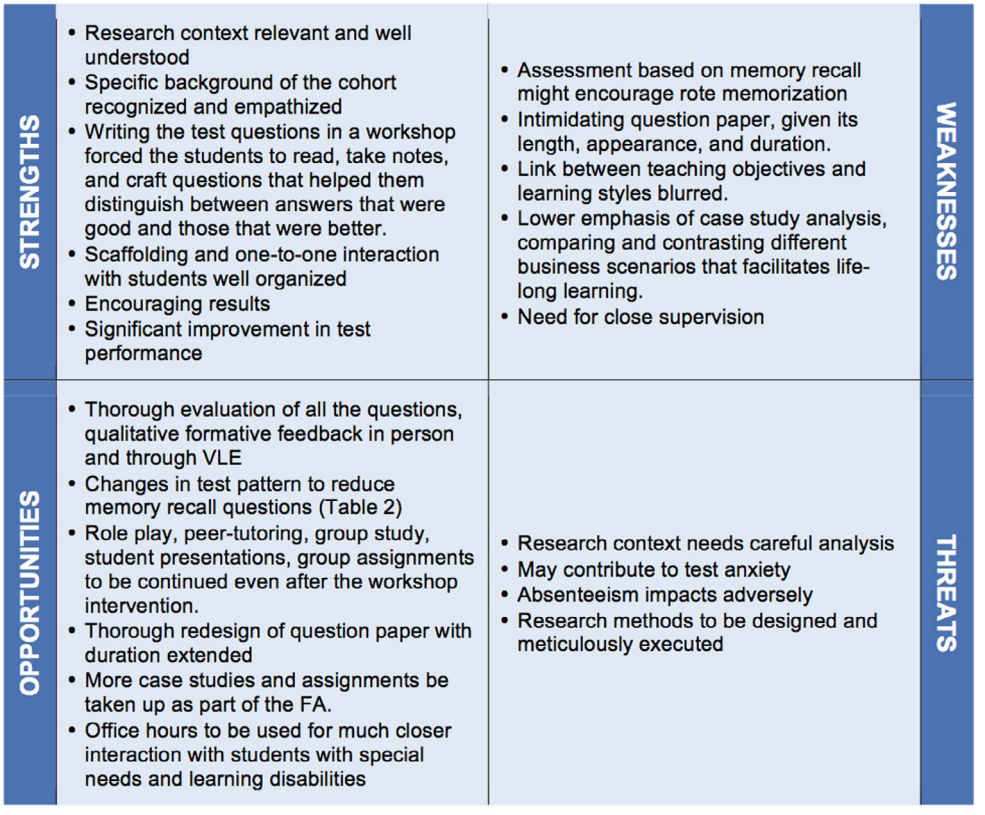

Figure 5. SWOT Analysis of academicians' peer review reports.

reviews I received, and for the latter are standard statistical tests. Therefore, I used qualitative analysis tools for the former, and quantitative analysis for the latter, analogous to the data collected. I analyzed the peer review reports through SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) (Figure 5).

How did I arrive at the conclusions and tested their validity?

I valued students engaging in unbridled enquiry in fair and fearless classroom the most. And I was able to facilitate that. I learned that only an actively engaged mind allows deep learning. I could engage a cohort inclined to rote learning and regurgitation (of the gist of power point slides) to self-directed learning. The fact that the cohort took responsibility for its progress gave me confidence that my methods worked. That I was able to handle tough students and bring out their right facets, conducive for learning was my best achievement, much more than content delivery as an instructor. I believe that showing the mirror to a student where she sees herself as an effective learner is more valuable than mere lecturing.

That none plagiarized, reinforced my belief in positive motivation. I had set learning goals in lieu of performance goals and it encouraged participation, resulting in reduced absenteeism. Lower absenteeism positively impacted the class performance in confirmation with

Marburger (2001). Although four students missed the workshop, they teamed with their classmates beyond the classroom and contributed to QB, in part due to their intrinsic motivation. This shows that the cohort harmonized.

Another important offshoot of the workshop was inclusiveness. Nervous, dyslexic and students with special needs, such as low attention span and linguistic skills took part actively, and bettered their deep learning post-workshop. Through incisive critiques and written feedback, I won their trust and motivated them to spend longer hours in exploratory reading even beyond the textbook. To promote deep learning, Biggs (2003, 31) also suggested of getting students to agree on appropriate task engagement as a good and impelling idea; which in other words can be called motivation.

Further, the EBL enhanced the class performance in the subsequent stages of FA and SA (Figures 6 and Figure 7). The class average score in Test 1 (before the intervention) was 65.8% (standard deviation (SD) = 21.2) with a wider range (11.3–90%). Mean performance of the class improved to 94.2% (SD = 5.7) in Test 2, while individual performance disparities plummeted (range = 77.5–100.0) (Figure 6). The improvement is statistically significant at 95% confidence interval (CI) as shown in Figure 7. In addition, the marks distribution of the class showed a skew towards higher scores.

Anecdotal responses post-intervention revealed that students feared the tests less, and enjoyed the process of acquiring knowledge, even beyond the classroom. In order to alleviate

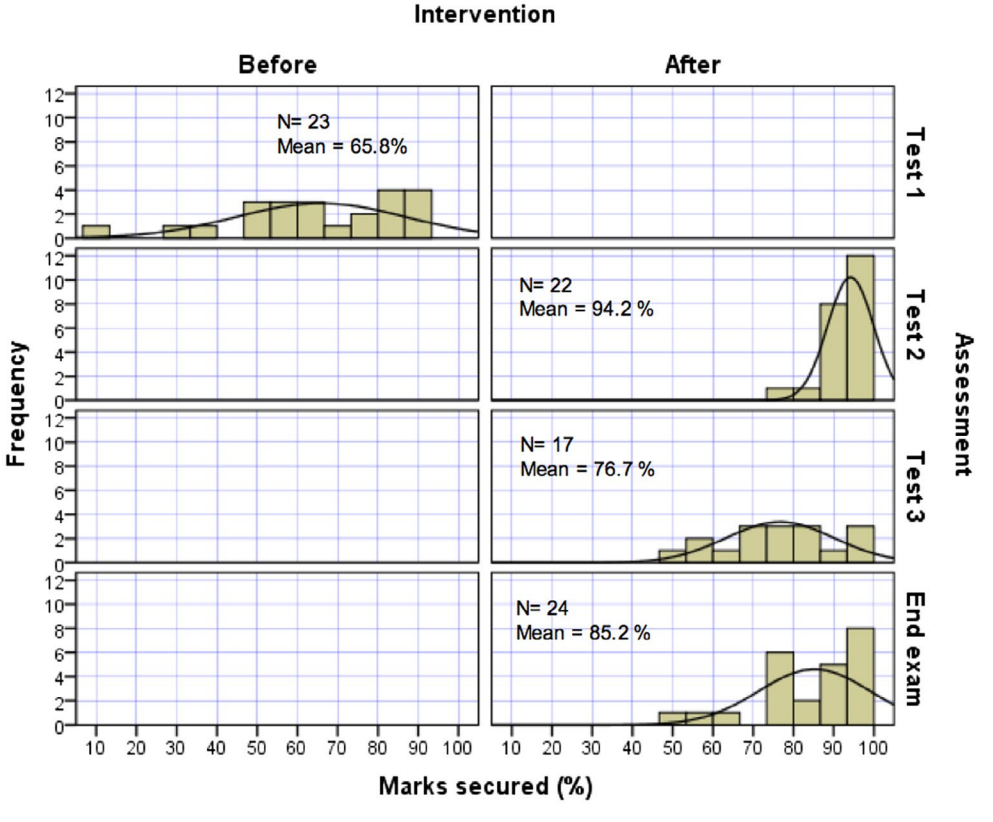

Figure 6. Marks distribution before and after EBL intervention in each of the three tests and end exam, showing improved performance post-intervention.

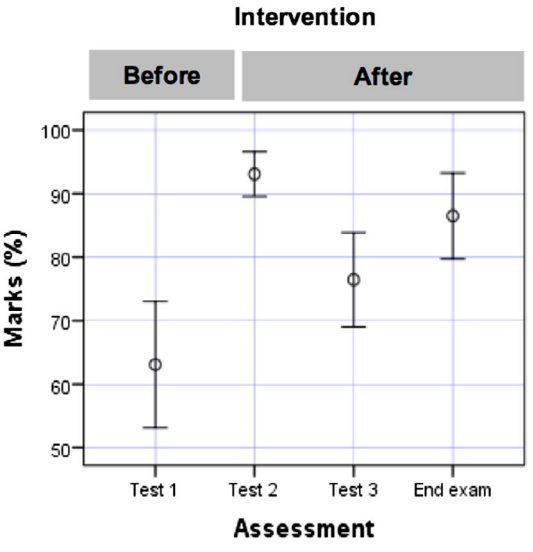

Figure 7. Marks obtained (mean %) in each of the three formative assessments and the summative assessment (end exam). Error bars indicate 95% CI.

test anxiety in learners with disabilities, I held special sessions and provided extra time for submissions. I gathered inferential evidence on alleviation of test anxiety from improved test performance, student's anecdotal responses post-intervention and end-of-semester student-teacher evaluation.

Teacher performance evaluation, although not a direct metric for pedagogic effectiveness sheds light on the students' point of view on the course deliverance. Therefore, cautiously treading the middle ground, I critically analyzed the student evaluation (Figure 8). A majority of the students voted very positively on all the evaluation criteria.

Where is my student's deep learning?

Active engagement within the class and outside fostered deep learning in students. This helped them in critical understanding of the content which in turn augmented their response capacity for analytical questions. I analyzed the students' performance in data recall and analytical questions for all the assessments (Figure 9). Student's analytical ability significantly improved in Test 2 and the End exam, at 95% CI. Their data recall knowledge also significantly moved up in Test 2. However, the difference in the cohort's mean response capacity in direct and analytical questions is not statistically significant in any single assessment as is noted in Figure 9. Although the workshop was held only before the second FA, it also enhanced subsequent performance. During post-EBL evaluations, I noticed students synthesizing and applying knowledge. These results converge with findings of other studies on critical thinking instruction effects on performance (Heijltjes et al. 2014), and surface learning negatively influencing performance in applied MCQ (Yonker 2011).

While two students resisted EBL experiment and their contribution dwindled with time, I noted EBL positively impacting the individual learners on the whole. All the test's data have been arranged in quartiles as shown in Table 2. The numbers indicate a student's quartile

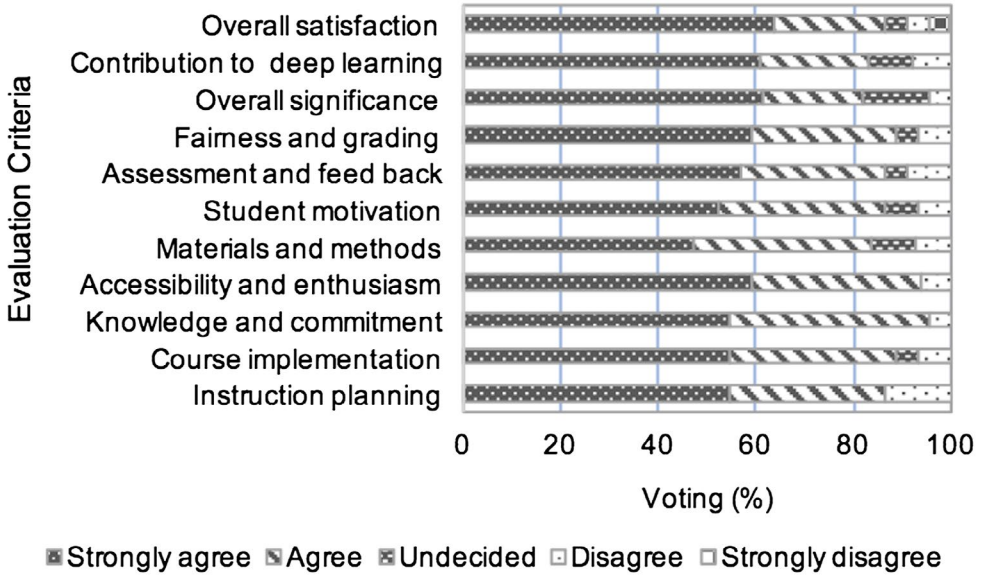

Figure 8. Student feedback on various evaluation criteria at the end of the semester ($N = 22$). More than 82% of the students either strongly agreed or agreed on the instructor's effectiveness on these criteria.

Table 2. Relative quartile positions of students in formative (Test 1, 2 and 3) and summative assessments (End exam) and the total score.

Student ID	Quartile position				
	Test 1	Test 2	Test 3	End exam	Total
1	1	1	2	2	2
2	1		1	1	1
3	2	3	2	2	3
4	1	1	1	2	2
5	3	3	3	4	4
6	2	1	1	1	1
7	1	1	2	1	2
8	3	2		3	2
9	2	3		3	1
10	4	2		4	3
11	2	3	4	3	4
12	3	3		1	1
13	4	4	4	4	4
14	1	1	3	1	2
15	2	3	3	3	3
16	4	4	3	4	4
17	2	3	2	3	3
18	3	2		1	1
19	3	3	2	4	4
20		4	4	2	2
21	3	2	4	2	4
22	4			3	1
23	3	1	1	3	3
24	4	4		4	3

Note: Highlighted cells indicate students, whose quartile position moved up from Test 1 onwards.

rank in each of the assessments. It also shows the relative grades of the students for the whole semester as indicated by the total grade. Although the average performance of the class improved due to the intervention, it had a sustained positive effect only on 59% students among 17 students who attended all the assessments.

It can be seen that the grades (quartile rank) of these students moved up from the first FA onwards (Table 2 and Figure 10). On the other hand, some of the students' relative grade showed little improvement or had come down. A close inspection of their attendance record revealed that four of these students have not attended the workshop. One student with learning disability displayed no relative improvement in grade, although her personal performance has improved. As attending two tests was compulsory, some students skipped Test 3.

The workshop had trickle down effects. Two of the students with special needs prepared their own QBs for the other tests' content also, and sought feedback, although not mandated. Better Test 2 performance positively charged them towards independent, deep learning. My diary entries recorded students voluntarily engaging in peer tutoring beyond the classroom. Students' ability to synthesize evidences their attaining higher cognitive domains with deep learning.

Providing formative feedback through in-class, VLE and during the office hours enhanced the students' response capacity and reduced anxiety. Moreover, offering 'discipline-specific discussions' during the workshop and later, augmented the cohort's constructive understanding. This is in agreement with the findings of Hodgson, Benson, and Brack (2013). Encouraging open discussions within groups, and constantly and consciously realigning the discourse to analytical understanding from grade orientation promoted deep learning. This increased the cohort's confidence levels and also perhaps alleviated test stress, in confirmation to Spada et al. (2006).

Where is my deep learning?

Structured reflection converted my experience into deep learning. Through reflection and class observation I found where I needed the course correction and methods to enhance students' learning efficiency. For example, QB had some redundancy, possibly due to the groups designing similar questions. Its size overwhelmed some students added to the assessment overload. Having realized these, I graded and ordered QB in terms of brevity and usefulness, which helped the students in effective understanding and analysis. I understood that students valued and used quick individual feedback better than generic comments aimed at the whole class.

Allotting bonus points to the authors of well-framed questions in place of negative points for poor performance, aided in focused learning without overburden. My recognition motivated and gave them a sense of achievement. Scaffolding eliminated the fear in asking for help and increased their engagement. I enthused the class to think aloud and experience the joy of learning through collective enquiry. At times through trial and error, I fine tuned my systems. By my reckoning, this context specific knowledge was unavailable in the literature.

Meta reflection helped me understand that a few students with highly individual learning styles preferred to work alone, although it did not impact their test grade. It could be that they might not have seen the group interaction intellectually engaging. As Volet, Summers,

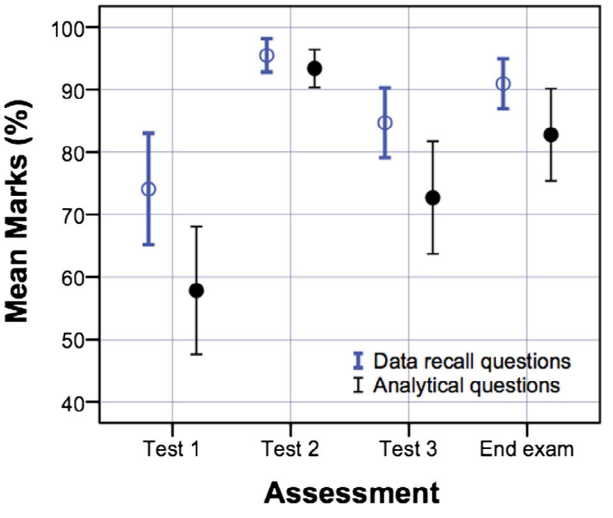

Figure 9. Mean percentage of marks in data recall and analytical questions under various assessments. Error bars indicate 95% CI.

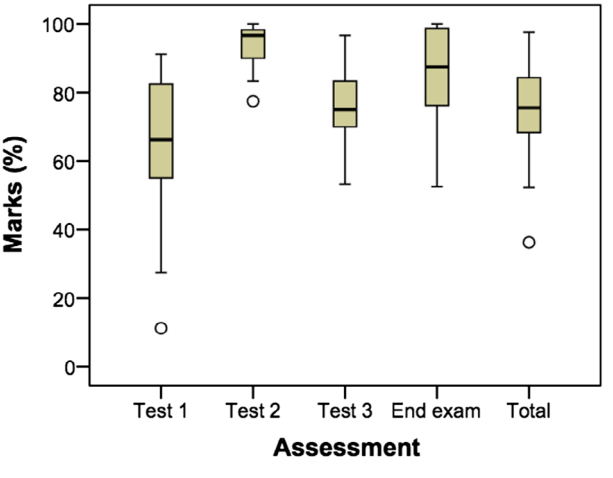

Figure 10. Box plot showing the class performance under various assessments and the semester total score.

and Thurman (2009) noted, active engagement in group learning activities can sometimes be limited to low-level exchange of information, sharing ideas and clarifying understandings, with drastic differences in the types of interactions among students. And all engagements do not result in construction of knowledge.

How did I modify my practices in light of my evaluation?

Peer reviews from my critical friends offered greater insight on what went wrong, could go wrong, and the lessons for future iterations. Based on this analysis and feed-forward, I undertook major structural, thematic and content changes in the subsequent stages of FA and SA, as shown in the Opportunities box in Figure 5.

Structured reflection

Through 'dialectical analysis' (Winter 1998), I stepped back and looked at my own practice from different vantage points (students', peers' and instructor's) at various levels and dimensions of reflection. Then, I redesigned the course delivery. I seldom used punishment or harsh language, for a threatened cohort resorts to surface learning, losing motivation. Moreover, encouraging the class to reflect after role-play developed students' attitudes to reflective learning. As Fry, Ketteridge, and Stephanie (2006, 18) noted, students might continue to use it in real life encounters, not only while studying, but throughout their professional lives.

Through reflection, I identified my pitfalls. The QB warranted a gargantuan effort in feedback, editing, and moderation from my side. Eventually, I could not extend this exercise to the subsequent lectures/ tests. One student resisted EBL and needed counseling. A few students with (1) high credit hour overload, and (2) very low English reading and writing comprehension skills neither contributed nor used the QB as expected.

Further to this, reflection directed me to pause and empathize with the learners on the fringes of the class, the habitual absentees and low scorers. As a consequence, I made the course inclusive by designing special assignments and assessment methods for them. I scaffolded and offered them extra leeway to utilize my office hours for clarification of doubts.

The AR facilitated me with ways I can transform and better my future practice as a teacher reflecting in action. I developed a deeper level of critical consciousness about the 'relational self', in that I started seeing the students' perspective along side mine. At the same wavelength, I noticed the students reciprocating, in true spirit of *'Tat Twam Asi'* (That art Thou). The following incident recorded in my diary acted as a critical signpost.

> I announced the submission schedule for an assignment along with the defaulter's penalties. In the evening while I was leaving, half a dozen students came to my office. Afra[2], the Syrian transfer student stepped forward and said this:
>
> *Doctor! We know you're working really hard for us. Even we want to make the best possible submission. When I Skype my classmates in Syria, I find that they are making best designs and submissions. With war all around them. They don't know if their dads and uncles come home alive for dinner or not. They don't know, they themselves will be there tomorrow. They are working really really hard. Walla! (by God). We have no such thing. Alhamdulillah! (Thank God). If we don't make good assignments, we feel ashamed. Give us some more time. Please!*

She was expressionless. Motionless I was, but for the moist eyes. I pasted a notice extending the deadline by a week on my door.'

Dialectical reflection trained me to be an empathetic listener. From linear lectures, I transformed my sessions into two-way interactions. Following Habermas (1987), I developed dialogical interests and focused on having open conversations through adopting attitudes and practices aimed at the flourishing of the cohort as much as myself. My pinnacle of achievement was reached when the cohort echoed my values, by not plagiarizing.

I feel that by collective critical engagement (teacher in epistemological engagement and the students in learning engagement), one can successfully transfer the *relational know-how* through demonstration. At this point, I am confident that the class can fully gear up to pick up the first two dimensions of professional competence, viz., subject knowledge and technical know-how with ease.

Further, appropriate goal setting motivates the learners intrinsically. It is important to remain accessible to offer quick/real-time unbiased feedback individually. This may prove

cumbersome, but it pays rich dividends. It makes complex text appear simple. As a result, students scale the learning domains faster.

What is the potential significance of what I have done?

Professional and organizational significance

Students and instructors attuned to rote and reception learning display strong affinity towards the strategic approach (grade orientation). This inertia is hard to break and might call for multi-pronged, targeted action across the institutional hierarchy. Change requires sustained practice and organizational discipline. Isolated practitioners like me can come together as change leaders to bring about institutional transformation. In a formative first step, I have initiated the idea of creating voluntary mentoring groups for teachers at the university. Action research through EBL workshop needs committed time as a major resource. Therefore, it is prudent to include it in the curricular mandates for long-term sustainability.

Being a senior academic in the department, I had the opportunity to guide young teachers. This research amplified my voice and afforded the *locus standi* to influence my colleagues. My presentation of the research findings during the graduation seminar of the Higher Education Academy's Fellowship Program enthused teachers from other departments. In a significant step forward, we included this methodology in the curricular design of another course and obtained similar results. That usable knowledge can be produced even in smaller communities of practice may draw new researchers into the practice with a multiplier effect. This democratization of knowledge which emanates from the surrounding social scenarios is valuable for Arab schools.

Personal significance

I hold my values dearly. Through this research, I found seamless alignment between my values, theoretical underpinnings and practical evidence. This reinforced my confidence in who I am. Further, from a disengaged strict task-master-instructor, I evolved into a reflecting dialectic practitioner. In a practice oriented discipline, content ranks above the medium. Through deep understanding, I became aware of the need for a mediating space between the content and expression for all the learners. Only this space can nurture a teaching-learning ecosystem with niches for every learner to thrive, blossom and flourish. Critical reflection is not only a way of approaching teaching – it is a way of life now, as what Larrivee (2000) calls. I learned to see myself in my students; and that the class reciprocates now, is significant to me in actualizing my dream of a relational self. Designing for inclusive teaching and learning in a conflict-free environment for unbridled enquiry is a natural corollary.

Summary

I used EBL workshop to bridge the teaching and learning gaps with a cohort accustomed to predominantly rote learning. Peer review and critical reflection at various stages offered important insights into the practice which resulted in positive changes. This research transformed me into a dialectically engaging teacher. Active engagement within and outside the

class facilitated deep learning. Students' response capacity significantly improved post-workshop. From linear methods of lecturing, I evolved into a critically reflecting practitioner to include the relational know-how into my teaching praxis. This knowledge-creation process is empowering and may draw many teacher researchers towards meta-reflexive engagement with the social systems around. These change drivers can initiate institutional overhaul to effect systemic reforms.

Notes

1. Name changed.
2. Name changed.

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Disclosure statement

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Appendix 1. End of semester student evaluation

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Evaluation

First Semester 2014/2015

Main Menu

- Students List
- Evaluation
- Insert Mark
- Show Previous Semesters Marks
- Insert Absences
- Staff Information
- Staff Schedule
- Send Email
- Faculties and Staff
- Staff Voting
- Advisor
- Remove Halted Students
- Final Exams

Instructor Name : Dr. Madhavi Indragtian
Faculty : College for Women
Instructor No : 855
Department : Architecture
Registration Semester : Second Semester 2014/2015

Campus	**: Female Campus**	**Section**	**: 814**
Degree	**: Bachelor**	**Course Code**	**: ID459**
Activity	**: Lecture**	**Course Name**	**: PROFESSIONAL PRACTICES**

Evaluation Semester : First Semester 2014/2015

Course Evaluation

Questions	Evaluation Count	Strongle Agree	Agree	Undecided	Disagree	Strongle Disagree
1. The course outline/syllabus was made clear to me. This included course content and objectives.	22	54.5	31.8	0.0	13.6	0.0
2. Assessment tasks and their criteria were made clear to me.	22	54.5	31.8	0.0	13.6	0.0
3. During the course, sources of help were made clear to me. This included reference material.	22	59.1	27.3	9.1	4.5	0.0
4. The course conduct and assignments were consistent with the course outline/syllabus.	22	50.0	40.9	0.0	9.1	0.0
5. The instructor was fully committed to the delivery of the course. (Eg. classes started on time, materials were well prepared, etc)	22	54.5	40.9	0.0	4.5	0.0
6. The instructor had thorough knowledge of the content of the course.	22	54.5	40.9	0.0	4.5	0.0
7 .The instructor was available during office hours.	22	59.1	36.4	0.0	4.5	0.0
8. The instructor was enthusiastic about the course.	22	59.1	36.4	0.0	4.5	0.0
9. The instructor cared about my progress in the course.	22	59.1	31.8	0.0	9.1	0.0
10. Course materials (texts, handouts, references etc.) were up-to-date and useful.	22	45.5	36.4	4.5	13.6	0.0
11. The resources needed for the course (textbooks, library, computers etc.) were available when I needed them.	22	50.0	31.8	13.6	4.5	0.0
12. Technology was very effectively used to support teaching and learning.	22	45.5	40.9	9.1	4.5	0.0
13. The instructor encouraged me to ask questions and develop my own ideas.	22	50.0	36.4	9.1	4.5	0.0
14. The instructor inspired me to do my best work.	22	54.5	31.8	4.5	9.1	0.0

15. Class activities, assignments, laboratories etc. helped me acquire the knowledge and skills intended by the course.	22	54.5	36.4	0.0	9.1	0.0
16. The amount of work I had to do in this course was reasonable for the credit hours allocated.	22	59.1	22.7	9.1	9.1	0.0
17. Marks for assignments and tests were given to me within one week of submission.	22	59.1	31.8	0.0	9.1	0.0
18. Grading of my tests and assignments was fair and reasonable.	22	59.1	27.3	9.1	4.5	0.0
19. The links between this course and other courses in my total program were made clear to me.	22	59.1	22.7	13.6	4.5	0.0
20. What I learned in this course is important and will be useful to me.	22	63.6	18.2	13.6	4.5	0.0
21. This course helped me to improve my ability to think and solve problems rather than just memorize information.	22	63.6	18.2	9.1	9.1	0.0
22. This course helped me to develop my skills in working as a team member.	22	59.1	22.7	13.6	4.5	0.0
23. This course improved my ability to communicate effectively.	22	59.1	27.3	4.5	9.1	0.0
24. Overall, I was satisfied with the quality of this course.	22	63.6	22.7	4.5	4.5	4.5